

# Monthly Marine Biotoxin Report

April 2007

Technical Report No. 07-16

## INTRODUCTION:

This report provides a summary of biotoxin activity for the month of April, 2007. Ranges of toxin concentrations are provided for the paralytic shellfish poisoning (PSP) toxins and for domoic acid (DA). Estimates are also provided for the distribution and relative abundance of *Alexandrium*, the dinoflagellate that produces PSP toxins, and *Pseudo-nitzschia*, the diatom that produces domoic acid. Summary information is also provided for any quarantine or health advisory that was in effect during the reporting period.

Please note the following conventions for the phytoplankton and shellfish biotoxin distribution maps: (i) All estimates for phytoplankton relative abundance are qualitative, based on sampling effort and percent composition; (ii) All toxin data are for mussel samples, unless otherwise noted; (iii) All samples are assayed for PSP toxins; DA analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA); (iv) Please refer to the appropriate figure key for an explanation of the symbols used on the maps.

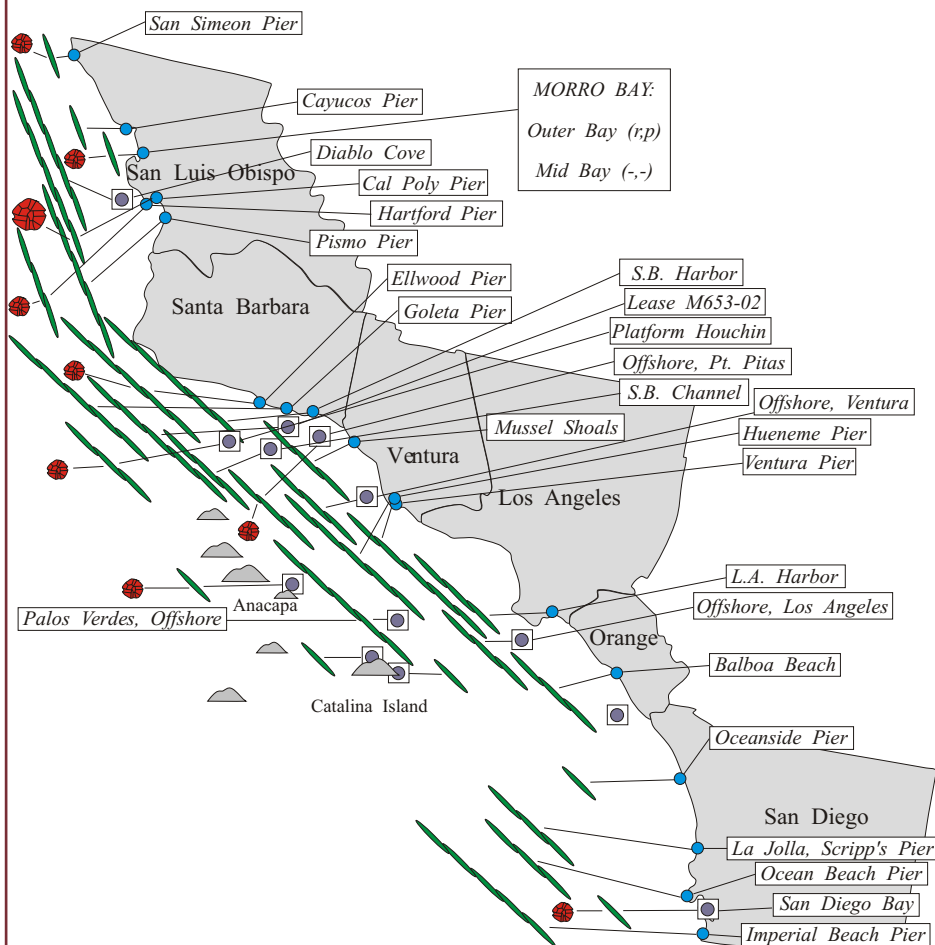
### Southern California Summary:

#### Paralytic Shellfish Poisoning

*Alexandrium* was observed at a number of sites between San Luis Obispo and San Diego counties during April (Figure 1). The

(Continued on Page 2)

Figure 1. Distribution of toxin-producing phytoplankton in Southern California during April, 2007.



### Relative Abundance of Known Toxin Producers

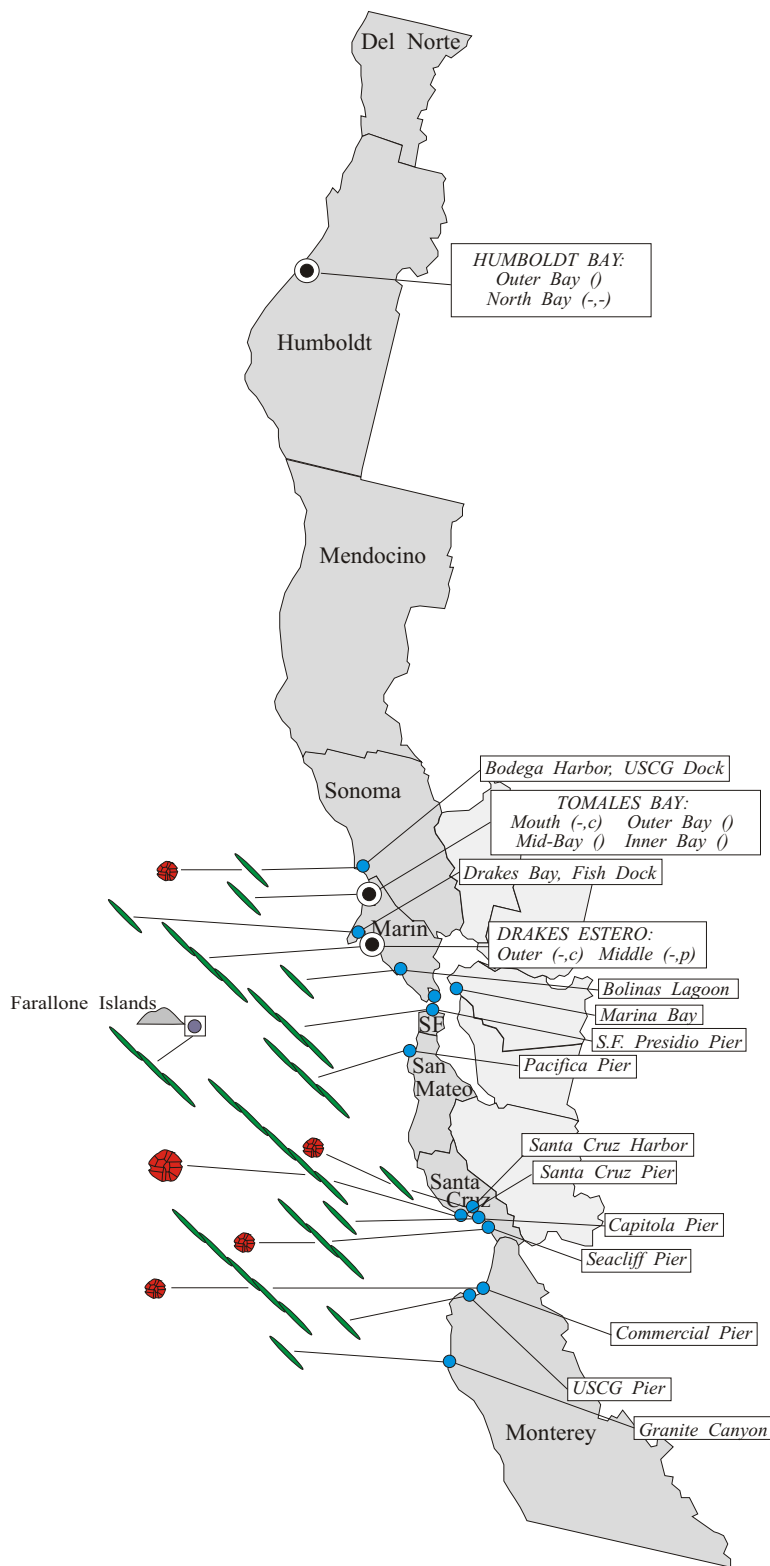
Alexandrium Species		Pseudo-nitzschia Species	
	Rare (less than 1%)		Present (less than 10%)
	Present (between 1% and 10%)		Common (between 10% and 50%)
	Common (between 10% and 50%)		Abundant (greater than 50%)
	Abundant (greater than 50%)		

#### MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:  
(a,p) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.  
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 2. Distribution of toxin-producing phytoplankton in Northern California during April, 2007.



(Continued from Page 1)

distribution of this dinoflagellate was similar to observations in March but the relative abundance was reduced throughout most of this region. *Alexandrium* was also observed offshore near Anacapa Island.

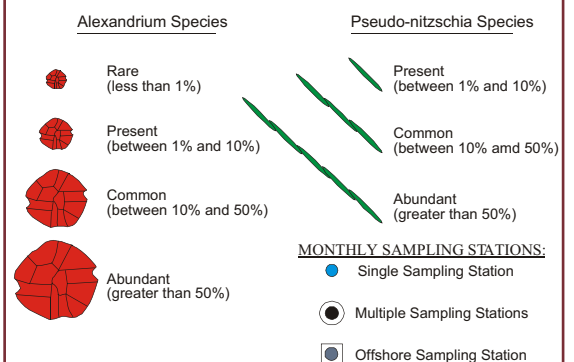
PSP toxins remained detectable but below the alert level in mussel samples from an aquaculture lease just offshore of Santa Barbara (Figure 3). Low levels of these toxins were also detected in mussels from northern Ventura County during the third week of the month.

### Domoic Acid

*Pseudo-nitzschia* continued to be observed in very high numbers along the entire Southern California coast in April (Figure 1). The relative abundance of this diatom began decreasing along the San Luis Obispo coast, with a sudden increase at the end of the month offshore of Diablo Canyon. Numbers of this diatom steadily increased throughout the month along the Santa Barbara coast and began increasing at sites in Los Angeles County by the end of the month. *Pseudo-nitzschia* densities were also elevated at sites in Ventura County in April. The highest relative abundances were observed offshore of Diablo Cove (April 26), followed by lower but significant levels offshore of Santa Barbara (April 26).

(Continued on Page 3)

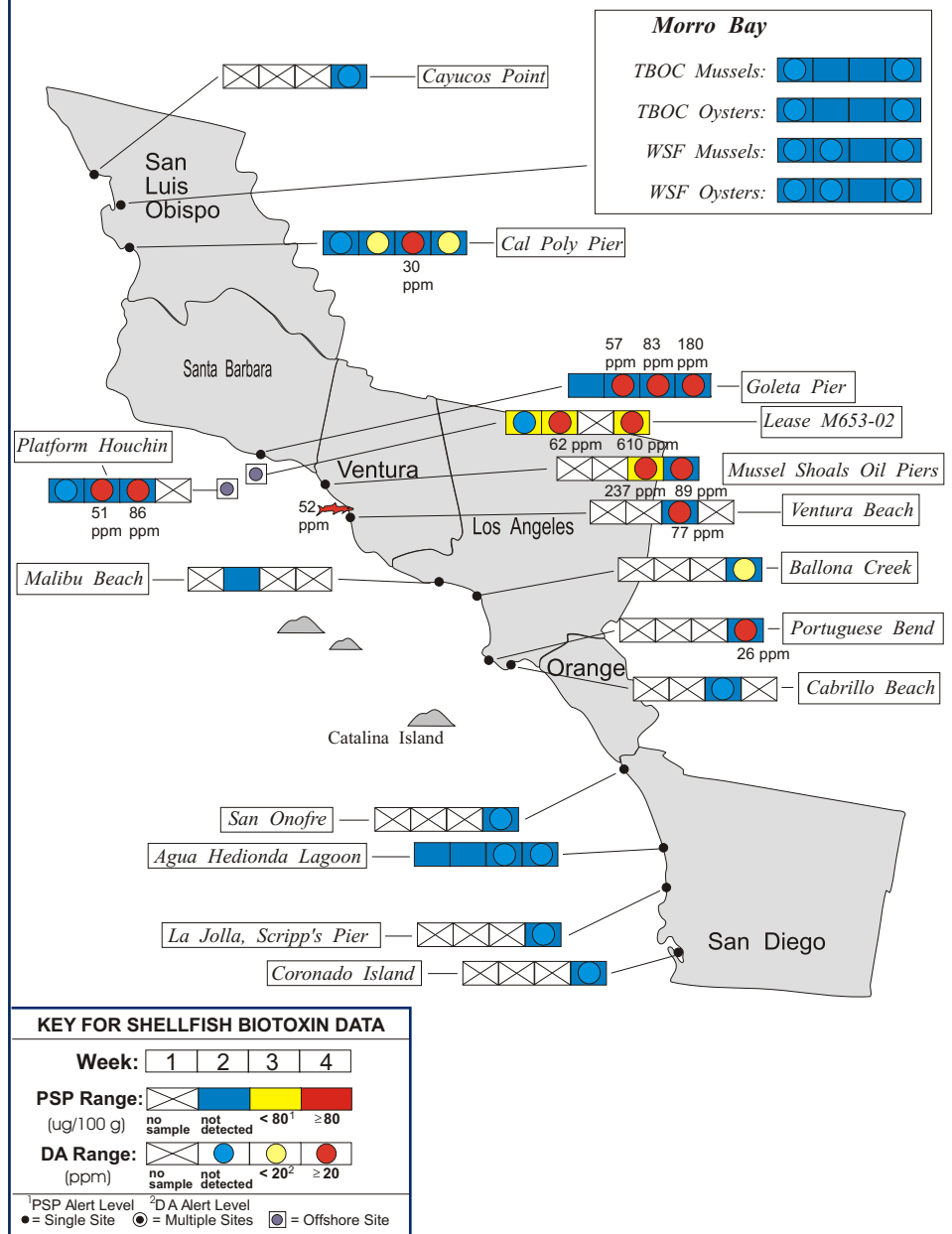
### Relative Abundance of Known Toxin Producers



For areas with multiple sampling stations, species abundance at each station is represented as follows:

(A,P) = Abundance for *Alexandrium* and *Pseudo-nitzschia*.  
e.g., (c,p) = common, present; (a,-) = abundant, not observed

Figure 3. Distribution of shellfish biotoxins in Southern California during April, 2007.



(Continued from Page 2)

Domoic acid concentrations increased in mussel samples from Avila through the first three weeks of April, reaching 30 ppm on April 20 (Figure 3), then declining rapidly to 1 ppm by April 30. In contrast to the gradual increase in toxin levels in Avila, several sites onshore and offshore of Santa Barbara experienced a sudden increase in domoic acid concentrations in shellfish samples by the second week of April. Mussels from an aquaculture lease less than one mile offshore went from a nondetectable level of domoic acid on April 4 to 62 ppm by April 11. By April 24 the concentration of domoic acid in mussels at this site had reached 610 ppm, the highest level recorded to date. Toxin levels also increased throughout the month in mussels from Platform Houchin, approximately three miles offshore, reaching 66 ppm by the third week of the month. Mussels from Goleta Pier reached 180 ppm of domoic acid by April 25. Very high concentrations of this toxin were also detected in mussels in Ventura County throughout the month, with a maximum concentration of 237 ppm on April 19. Mussels from Portuguese Bend (Los Angeles County) contained 26 ppm of domoic acid in sample collected on April 27. None of the samples collected south of Los

(Continued on Page 4)

The Marine Biotoxin Monitoring and Control Program, managed by the California Department of Health Services, is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins and domoic acid.

The Phytoplankton Monitoring Program is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact the public. The phytoplankton monitoring and observation effort can provide an advanced warning of a potential toxic bloom, allowing us to focus sampling efforts in the affected area before California's valuable shellfish resources or the public health is threatened.

For More Information Please Call:  
(510) 412-4635

For Recorded Biotoxin Information Call:  
(800) 553-4133

(Continued from Page 3)

Angeles contained measurable amounts of this toxin.

Non-toxic Species

Diatoms were common along the Southern California coast and included such species as *Chaetoceros*, *Lauderia*, and *Leptocylindrus*. Several species of the dinoflagellate *Ceratium* were also common, particularly farther south along the San Diego coast.

Northern California Summary:

Paralytic Shellfish Poisoning

*Alexandrium* was observed in low numbers between Monterey and Sonoma counties (Figure 2). Only one shellfish sample from Northern California contained a measurable level of the PSP toxins. Sentinel mussels from the Santa Cruz Pier contained 38 ug/100g tissue on April 5 (Figure 4).

Domoic Acid

The distribution of *Pseudo-nitzschia* was similar to observations in March, however the relative abundance increased inside Monterey Bay (Figure 2). A low level of domoic acid was detected in a sentinel mussel sample from Santa Cruz Pier on April 5.

Non-toxic Species

The diatoms *Chaetoceros*, *Skeletonema*, and *Thalassiosira* continued to dominate the Northern California coast in April.



QUARANTINES:

The annual mussel quarantine was initiated early, on April 20, due to the widespread increase in domoic acid levels along the coast. The annual quarantine, which normally goes into

(Continued on Page 5)

Figure 4. Distribution of shellfish biotoxins in Northern California during April, 2007.

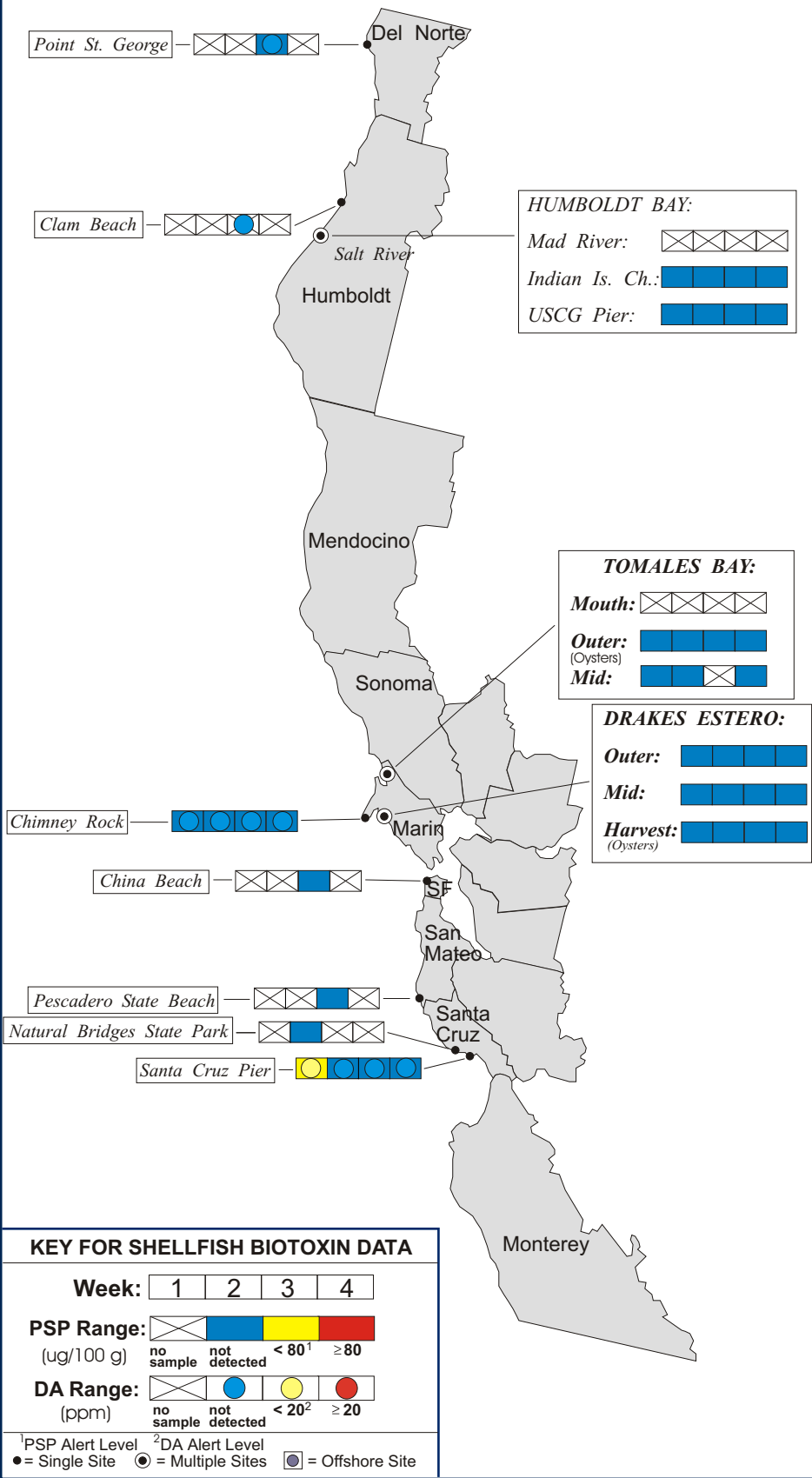


Table 1. California Marine Biotoxin Monitoring Program participants submitting shellfish samples during April, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	Del Norte County Health Department	1
Humboldt	Coast Seafood Company	8
	Humboldt State Marine Lab	1
Mendocino	None Submitted	
Sonoma	None Submitted	
Marin	Cove Mussel Company	3
	Drakes Bay Oyster Company	16
	Hog Island Oyster Company	4
	CDHS Marine Biotoxin Monitoring Program	9
San Francisco	San Francisco County Health Department	1
San Mateo	San Mateo County Environmental Health Department	1
Santa Cruz	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health Department	1
Monterey	None Submitted	
San Luis Obispo	Cal Poly	13
	Tomales Bay Oyster Company	8
	Williams Shellfish Farms	8
	CDHS Volunteer (Otto Schmidt)	1
Santa Barbara	Central Coast Shellfish Company	4
	Santa Barbara Mariculture Company	7
	U.C. Santa Barbara	4
Ventura	Ventura County Environmental Health Department	3
Los Angeles	Los Angeles County Health Department	4
Orange	None Submitted	
San Diego	Carlsbad Aquafarms, Inc.	4
	Scripps Institute of Oceanography	1
	CDHS Volunteer (Steve Crooke)	2

(Continued from Page 4)

effect on May 1 of each year, applies specifically to sport-harvested mussels and is in effect for the entire California coastline, including all bays and estuaries. Routine phytoplankton and biotoxin monitoring is maintained throughout the quarantine period. The annual quarantine does not affect the certified commercial shellfish growing areas in California. All certified shellfish growers are required to submit at least weekly samples of shellfish for toxin monitoring. Harvest restrictions or closures are implemented as needed to protect the public's health.

On April 27 the State Public Health Officer warned the public to avoid eating sport-harvested species of bivalve shellfish, sardines and anchovies, or the organs or viscera of sport-harvested or commercially sold lobster or crab taken from the coast between San Luis Obispo and Orange counties. This advisory was the result of the Department's monitoring efforts, which detected elevated levels of domoic acid in a variety of seafood species.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. Washington clams can concentrate the PSP toxins in the viscera and in the dark parts of the siphon. Razor clams are an exception to this guidance due to their ability to concentrate and retain domoic acid in the edible white meat.

Consumers are also advised that cooking does not eliminate the toxins from the shellfish tissue. Sport harvesters are encouraged to contact the "Biotoxin Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity prior to gathering and consuming shellfish.





Table 2. Agencies, organizations and volunteers participating in marine phytoplankton sample collection during April, 2007.

COUNTY	AGENCY	# SAMPLES
Del Norte	None Submitted	
Humboldt	Coast Seafood Company	4
Mendocino	None Submitted	
Sonoma	CDHS Volunteer (Cathleen Cannon)	2
Marin	Audubon California	3
	CDHS Volunteers (Brent Anderson, Cal	7
	Drakes Bay Oyster Company	8
	CDHS Marine Biotoxin Monitoring	4
Contra Costa	CDHS Marine Biotoxin Monitoring	3
San Francisco	CDHS Volunteers (Eugenia McNaughton,	5
San Mateo	San Mateo County Environmental Health	2
	The Marine Mammal Center (Stan Jensen)	4
Santa Cruz	The Marine Mammal Center (Nancy	3
	U.C. Santa Cruz	4
	Santa Cruz County Environmental Health	3
Monterey	Monterey Abalone Company	4
	CDHS Volunteer (Jerry Norton)	1
	Marine Pollution Studies Laboratory	5
San Luis	CDHS Volunteer (Renee and Auburn	1
	Cal Poly	10
	Monterey Bay National Marine Sanctuary	4
	Morro Bay National Estuary Program	2
	Tenera Environmental	2
	The Marine Mammal Center (Debbie	5
	Tomales Bay Oyster Company	1
Santa Barbara	Central Coast Shellfish Company	1
	CDHS Volunteer (Sylvia Short)	4
	Channel Is. National Marine Sanctuary	3
	Santa Barbara City College	1
	Santa Barbara Channel Keeper	2
	Santa Barbara Mariculture Company	4
	U.C. Santa Barbara	5
Ventura	CDHS Volunteer (Fred Burgess)	4
	Channel Islands National Marine	2
	Ventura County Environmental Health	2
Los Angeles	Catalina Island Marine Institute	1
	Los Angeles County Sanitation District	4
	Guided Discoveries, Tole Mour	12
	Southern California Marine Institute	2
Orange	CDHS Volunteer (Debbie Karimoto)	1
	Ocean Institute	1
San Diego	Avian Research Associates	4
	CDHS Volunteers (Paul Sims, Randy Dick)	5
	Scripps Institute of Oceanography	5

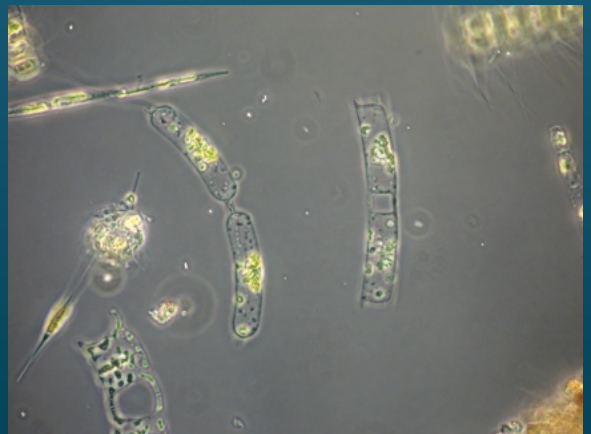
## PHYTOPLANKTON GALLERY



The diatom *Lauderia* was common at many sites along the California coast.



A rare sighting of the diatom *Isthmia* was made in April.



Two views of the diatom *Hemialus*.